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HIDDEN HINGE**BACKGROUND OF THE INVENTION**

The present invention relates to the manufacture of wings of furniture items and doors in general and in particular it pertains to hidden hinges to articulate the wings to the fixed part of the furniture item and more in general the doors to the related door post.

These hinges, currently called invisible hinges, are partly contained inside the thickness of the door and partly inside the thickness of the door post and comprise in particular two fastening elements to connect the hinge respectively to the door and to the door post; arms, each of which is connected to the two fastening elements with their first extremity hinged on a fixed pivot pin of one of the fastening elements and with the other extremity engaged in a sliding guide borne by the other fastening element; and lastly a pivot pin, interposed at the extremities of the arms, which connects the arms in mutually pivoting fashion being able to move, remaining parallel to itself, in the opening and closing motion of the door.

In rather complicated and sophisticated hinges of this kind no adjustment in any of three directions in space is permitted to the door with respect to its fixed post. Infact, they are provided with fastening means of the hinge which are articulated exclusively with one another, but fixed in space once applied.

Furthermore, in known hinges of this kind, the arms are equal in shape and dimensions and are generally perfectly reversible relative to each other. Moreover, the fastening elements contained in the thickness of the wing and of the door post are opposite and mutually aligned. This conformation of the hinges generally determines the impossibility of positioning the door, in the open condition, flush with the door post when this post is provided with an outer finishing cornice.

In practice, the distance, measured between the front surface of the post and the plane of the door opened at an angle of 180 degrees, is never sufficient to permit the application of a standard finishing cornice, the thickness of which is always greater than such a distance. Generally, therefore, if, as almost always happens, the cited finishing cornices were to be applied on the exterior of the post, the door would open only partially, at an angle of approximately 90 to 100 degrees, unless hollows are produced in the front part of the post so as to allow the application of the cornice, but thus greatly increasing the number of operations and the time needed for the application itself.

SUMMARY OF THE INVENTION

The aim of the present invention is to eliminate such drawbacks by means of a hinge so shaped as to allow the wing to position itself, in the open condition, rigorously flush with a door post having a finishing cornice, the hinge being adjustable along the three cartesian axes, thus permitting the adjustment of door verticality and squaring and the recovery of any imperfection in the assembly.

In accordance with the invention this aim is reached by a hinge according to claim 1, wherein the arms have mutually different lengths, at least in correspondence with their portion positioned between the respective first extremities and the intermediate articulation pivot pin, to allow the complete rotation of the door relative to the door post up to an angle of 180 degrees, at least until reaching a condition in which the door is positioned parallel to the finishing cornice.

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The hinge is also provided with adjustment means which allow in particular to adjust the arms along a vertical direction passing through the intermediate pivot pin.

If the adjustment means are so devised as to allow also the adjustment of the hinge along two additional horizontal directions orthogonal to each other and to the vertical direction, the hinge according to the invention is also adjustable in all directions in space.

BRIEF DESCRIPTION OF THE DRAWINGS

The technical features of the invention, according to the aforesaid aims, can clearly be noted from the content of the claims set out below and its advantages shall become more readily apparent in the detailed description that follows, made with reference to the accompanying drawings, which show an embodiment provided purely by way of non limiting example, in which:

FIG. 1 is a top plan view of a door and of a door post shown in closed condition, provided with hinges according to the invention, and sectioned at the height of one of the hinges with section plane indicated with trace I—I in FIG. 4;

FIGS. 2 and 3 are top plan views of the door and of the door post sectioned as in FIG. 1 and shown respectively in a partially opened and in a fully opened condition of the door;

FIG. 4 is an overall view of the hinge sectioned with a vertical plane of trace IV—IV indicated in FIG. 1, showing a view of the arms of the hinges not sectioned;

FIGS. 5 and 6 are views of the hinge of FIG. 4 sectioned respectively with the planes V—V and VI—VI and shown with some parts removed the better to highlight others;

FIG. 7 is a view corresponding to FIG. 4 showing the hinge in a sample adjustment condition.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to the accompanying drawings, the reference number 20 globally indicates a hinge for doors 3, or wings of furniture items, of the type hidden in the thickness of the door 3 and in the thickness of the related fixed door post 4, associated to the frame of the door itself or to the fixed structure of the furniture item.

The hinge 20 (FIG. 1) essentially comprises fastening elements 1 and 2, stably secured to the door 3 and to the door post 4, and two arms 5', 5" which, advantageously articulated to each other and to the fastening elements 1, 2, allow to connect the door 3 pivotingly to the door post 4, as is necessary for the related opening and closing. Elastic return means 19 are positioned between the fastening elements 1, 2 and the two arms 5', 5". In particular, the fastening elements are embodied by corresponding internally hollow bodies 1 and 2, preferably made of metallic material and provided with planar flanges 21 (FIGS. 4, 5 and 6). The bodies 1, 2 are housed in the thickness of the door 3 and of the door post 4 (FIGS. 1, 2 and 3) and in the closed condition of the door 3 they are mutually opposite, but not aligned.

Each of the bodies 1 and 2 is internally provided with a fixed pivot pin 7', 7" and with a groove, which embodies a sliding guide 9', 9". The pivot pins 7', 7" are oriented parallel to a vertical direction Z. The sliding guides 9', 9" are instead rectilinear and oriented orthogonal to the pivot pins 7', 7".

Each arm 5', 5" is connected to both fastening elements 2, 1. More in particular, a first extremity 6', 6" of each arm 5', 5" is hinged on the fixed pivot pin 7', 7" of one of the